

1. (Currently Amended) A device for detecting a cellular metabolic process associated with a cell by detecting a luminescence event in, at, or in the immediate vicinity of the cell, the device comprising:

a carrier element with a surface prepared for coupling of the cell thereto;

a detector for receiving a luminescence signal indicative of the luminescent event, where the detector is integrated into the carrier element below the prepared surface;

a cover covering the prepared surface to form a cavity, the cover having an inlet and an outlet; and

an—one of a biological cell metabolizing excitation source and a chemical cell metabolizing excitation source connected to the inlet and accepting a biological or chemical excitation medium that includes a luminophore, where the excitation medium influences the metabolism of the cell during excitation thereof by the medium, and where the luminophore reacts with a metabolic product of the cell during the excitation thereof to thereby provide the luminescence signal.

2. (Previously Presented) The device of claim 1, further comprising an optical filter located between the prepared surface and the optical detector.

3. (Previously Presented) The device of claim 1, where the carrier element is a semiconductor body.

4. (Previously Presented) The device of claim 1, where a plurality of optical detectors are integrated into the carrier element below the prepared surface.

5. (Previously Presented) The device of claim 1, where the optical detector comprises a photodiode.

6. (Previously Presented) The device of claim 1, further comprising an evaluation circuit connected to the detector.

7. (Previously Presented) The device of claim 1, further comprising an evaluation circuit integrated into the carrier element.

8. (Previously Presented) The device of claim 1, further comprising an evaluation circuit that controls the excitation source to send the chemical or biological excitation medium to the inlet opening.

9. (Previously Presented) The device of claim 1, further comprising a valve disposed in an inlet line between the excitation source and the inlet to control a supply of the excitation medium to the inlet.

10. (Previously Presented) The device of claim 1, where the prepared surface includes an adhesion matrix and/or a growth substrate for the cell coupled thereto.

11. (Previously Presented) The device of claim 10, where the growth substrate comprises gelatin.

12. (Previously Presented) The device of claim 1, where the prepared surface has a cell-immobilizing medium applied thereto.

13. (Previously Presented) The device of claim 12, where the cell-immobilizing medium comprises negatively charged polystyrene.

14. (Previously Presented) The device of claim 1, where cell is immobilized at the prepared surface.

15. (Previously Presented) The device of claim 1, where a depression is created in at least a portion of the prepared surface.

16. (Previously Presented) A method for detecting a luminescence signal using a sensor at, or in the immediate vicinity of a cell, a cell cluster, or a tissue, the method comprising the steps of:

immobilizing the cell at a surface of the sensor prepared for receiving cells;

introducing a luminophore reacting with a cell metabolic product in the cell or in the vicinity of the cell;

stimulating the cell by a chemical or biological substance; and

detecting the luminescence signal.

17. (Previously Presented) The method of claim 16, where the luminescence signal is detected with temporal resolution.

18. (Currently Amended) A device for detecting a cellular metabolic process associated with a cell by detecting a luminescence event in, at, or in the immediate vicinity of the cell, the device comprising:

a semiconductive device with a surface prepared for coupling of the cell thereto;  
a detector for providing a luminescence signal indicative of the luminescent event, where the detector is integrated into the semiconductive device below the cell;  
a cover that covers the prepared surface to form a cavity, the cover having an inlet and an outlet; and

an one of a biological cell metabolizing excitation source and a chemical cell metabolizing excitation source that provides to the cavity via the inlet a biological or chemical excitation medium that includes a luminophore, where the excitation medium influences the metabolism of the cell during excitation thereof by the medium, and where the luminophore reacts with a metabolic product of the cell during the excitation thereof to provide luminescence detected by the detector.

19.( Previously Presented) The device of claim 18, further comprising an optical filter located between the prepared surface and the optical detector, and where a plurality of optical detectors are integrated into the semiconductive substrate below the prepared surface.

20. (Previously Presented) The device of claim 18, further comprising an evaluation circuit semiconductive that controls the excitation source to send the chemical or biological excitation medium to the inlet opening.

21. (Previously Presented) The device of claim 18, where the prepared surface has a cell-immobilizing medium applied thereto.

22. (Currently Amended) A device for detecting a cellular metabolic process associated with a cell by detecting a luminescence event, the device comprising:

a semiconductive device with a surface prepared with a cell-immobilizing medium for coupling and immobilizing of the cell thereto;

a detector for providing a luminescence signal indicative of the luminescent event, where the detector is integrated into the semiconductive device below the cell and prepared surface;

a housing that in cooperation with the prepared surface forms a cavity having an inlet and an outlet; and

an—one of a biological cell metabolizing excitation source and a chemical cell metabolizing excitation source that provides to the cavity via the inlet a biological or chemical excitation medium that includes a luminophore, where the excitation medium influences the metabolism of the cell and the luminophore reacts with a metabolic product of the cell to provide luminescence detected by the detector.